INSTRUCTION MANUAL

Model CS205 10-Hour Fuel Temperature Stick

Revision: 5/08

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Model CS205 10-hour Fuel Temperature Stick

1. General Description

The CS205 Temperature Stick is a Ponderosa pine dowel 4.5 inches long and 0.5 inches in diameter. The dowel is fabricated to USFS specifications, to be used as a fuel moisture sensor. Campbell Scientific, Inc. has bored a hole and cut a split into one end of the dowel. A model 107 Temperature Probe is inserted into the CS205 to measure fuel temperature.

The CS205 Fuel Temperature Stick mounts on the 10974 Fuel Moisture/Temperature Mounting Stake. The CS205 is most commonly installed along with a CS505 Fuel Moisture Sensor but can be used alone.

2. Specifications

Fuel Temperature Stick	
Diameter	0.5 inches
Length	4.5 inches
Wood Type	Ponderosa Pine
Bore Hole	about 1/4 inch

3. Installation

Insert a 107 temperature probe into the CS205 Fuel Moisture Stick. The CS205 installs in the white compression fitting on the 10974 Fuel Moisture/ Temperature Mounting Stake. Loosen the compression fitting so that the CS205 can be inserted. The CS205 inserts into the compression fitting so that compression is applied to the split end of the stick gripping the 107 probe.

Please refer to the 107 probe manual for a complete discussion of the 107 probe.

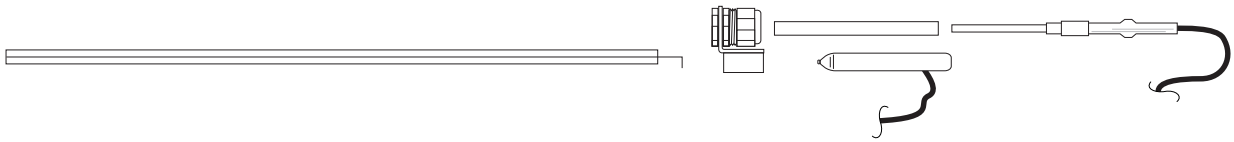

FIGURE 3-1. Exploded View of CS505 and CS205 Mounting

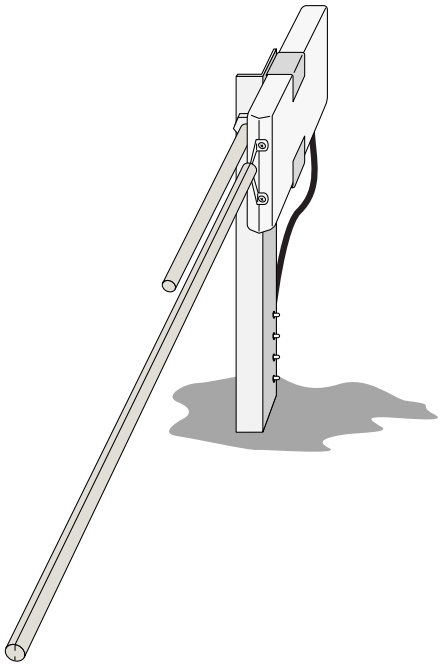

FIGURE 3-2. CS205 Mounts on the Mounting Stake with the CS505

4. Wiring

Connections to Campbell Scientific dataloggers are given in Table 4-1. Temperature is measured with one Single-Ended input channel and an Excitation channel.

TABLE 4-1. Wiring for CS205

Color	Description	CR800 CR5000 CR3000 CR1000	CR510 CR500 CR10(X)	CR21X CR7 CR23X
Black	Excitation	Switched Excitation	Switched Excitation	Switched Excitation
Red	Temperature Signal	Single-Ended Input	Single-Ended Input	Single-Ended Input
Purple	Signal Ground	⏚	AG	⏚
Clear	Shield	⏚	G	⏚

Please refer to the 107 probe manual for a complete discussion of the 107 probe.

5. Datalogger Programming

This section is for users who write their own datalogger programs. A datalogger program to measure this sensor can be created using Campbell Scientific's Short Cut Program Builder software. You do not need to read this section to use Short Cut.

The Temp107 measurement instruction (P11), is used with dataloggers that are programmed with Edlog (e.g. CR10X, CR23X) to measure the 107 probe. P11 makes half bridge voltage measurement, and converts the measurement result to temperature using a fifth order polynomial. With a multiplier of 1 and an offset of 0, the output is temperature in degrees C. With a multiplier of 1.8 and an offset of 32, the output is temperature in degrees F.

The Therm107 measurement instruction is used with dataloggers that are programmed with CRBasic (e.g. CR1000) to measure the 107 probe. Therm107 makes a half bridge voltage measurement, and converts the measurement result to temperature using the Steinhart-Hart equation. With a multiplier of 1 and an offset of 0, the output is temperature in degrees C. With a multiplier of 1.8 and an offset of 32, the output is temperature in degrees F.

5.1 CR1000 Programming

```
'CR1000
'This example program measures a single 107 Thermistor probe
'every 10 seconds and stores the average temperature every 60 minutes.

'Declare the variables for the temperature measurement
Public T107_C

'Define a data table for 60 minute averages:
DataTable(Table1,True,-1)
    DataInterval(0,60,Min,0)
    Average(1,T107_C,IEEE4,0)
EndTable

BeginProg
    Scan(10,Sec,1,0)
        'Measure the temperature
        Therm107(T107_C,1,1,Vx1,0,_60Hz,1.0,0.0)
        'Call Data Table
        CallTable(Table1)
    NextScan
EndProg
```

5.2 CR10X Programming

```
;{CR10X}
*Table 1 Program
  01: 10            Execution Interval (seconds)

1: Temp (107) (P11)
  1:  1             Reps
  2:  1             SE Channel
  3:  21            Excite all reps w/E1, 60Hz, 10ms delay
  4:  1             Loc [ T107_C    ]
  5:  1.0           Multiplier
  6:  0.0           Offset

3: If time is (P92)
  1:  0             Minutes (Seconds --) into a
  2:  60            Interval (same units as above)
  3:  10            Set Output Flag High (Flag 0)

4: Set Active Storage Area (P80)
  1:  1             Final Storage Area 1
  2:  101           Array ID

5: Real Time (P77)
  1:  1220          Year,Day,Hour/Minute (midnight = 2400)

6: Average (P71)
  1:  1             Reps
  2:  1             Loc [ T107_C    ]
```

6. Maintenance and Calibration

The 107 Probe requires minimal maintenance. Please refer to the 107 manual for more detail.

The CS205 Fuel Moisture Stick should be changed annually or more frequently as required. The wood should visually appear fresh and new not gray or discolored.

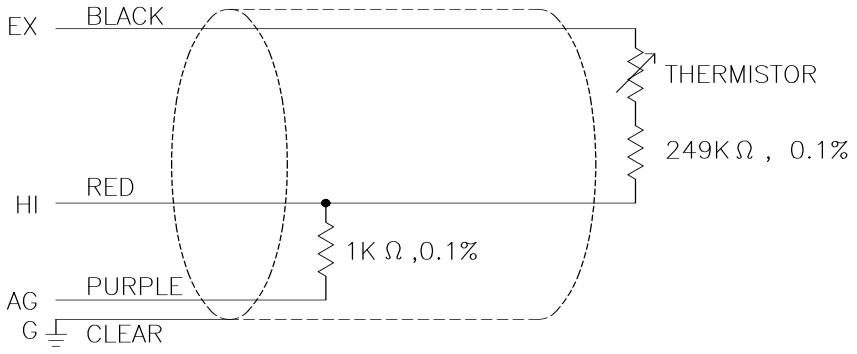

FIGURE 6-1. 107 Thermistor Probe Schematic

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